BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 10/662,406
Filing Date: September 16, 2003
Appellant(s): PARK ET AL.

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For Appellant

SUPPLEMENTAL EXAMINER'S ANSWER

This is in response to the Reply Brief filed 13 November 2007 in response to the

Examiner Answer mailed 11 September 2007.

(1) Real Party in Interest

The above-identified application is assigned, in its entirety, to LG Electronics Inc.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

Claims 5 and 14 under 35 U.S.C. § 112, second paragraph.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,222,512	Tajima et al.	4-2001
2003/0011626	Tanabe et al.	1-2003

AAPA, Figure 1 and page 1, line1 to page 4, line 30 of the specification

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless —
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 5-6, 14-15, 21-22 and 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Tajima et al. (US 6,222,512).

Regarding claim 5, Tajima et al. disclose a driving apparatus for a plasma display panel in which one frame period is time-divided into a plurality of sub-fields each given by a certain weighting value (Figure 1 shows a driving apparatus for a plasma display panel and column 15, lines 36-51 explain that the frame period is divided into a plurality of sub-fields.), said driving apparatus comprising:

a gray level detector for detecting a gray level distribution of a data (Figure 3, gray-scale level adjustment means 75 is explained in column 26 lines 10-45 to have an intensity data arrangement switching means 101 that disperses and arranges the sub-frames.) and

an adjuster for adjusting at least one of the number of sustaining pulses or a sub-field arrangement in accordance with a gray level distribution of said data (Figure 1, the gray-scale level adjustment means 75 is stated in column 16, lines 1-14 to establish which sub-frames are to be combined and how these are to be arranged in sequence. See also column 26, lines 18-52 and column 27, lines 3-19).

Regarding claim 6, Tajima et al. disclose the driving apparatus as claimed in claim 5, wherein said adjuster adjusts both the number of sustaining pulses and- a sub-field arrangement accordance with the gray level distribution of said data (The examiner understands that if the number of subfields and the arrangement is changed, that by changing the subfields used the number of sustaining pulses is changed, please refer to column 27, lines 7-16 and Figures 16 and 17 for an example.).

Regarding claim 14, this claim is rejected under the same rationale as claim 5.

Regarding claim 15, this claim is rejected under the same rationale as claim 6.

    Regarding claim 21, Tajima et al. disclose the driving apparatus of claim 5, wherein the number of the sub-fields after said adjustment equals the number of sub-fields before said adjustment for driving the panel (Column 16, 14-33 explain that the sub-fields are re-arranged, but the number of subfields stays the same.).

    Regarding claim 22, Tajima et al. disclose the driving apparatus of claim 5, wherein the weighting value assigned to each of the predetermined number of sub-fields is same before and after said adjustment (Column 16, 14-33 explain that the sub-fields are re-arranged, such as SF6 in the middle and SF1 and SF2 on the ends, but the weighting value assigned to them is the same.).

    Regarding claim 28, Tajima et al. disclose the driving apparatus of claim 5, wherein the adjuster includes: a sub-field arrangement selector which selects one of a plurality of pre-stored sub-field arrangements based on the gray-level distribution of said data (As stated in the rejection of claim 5, Figure 1 shows gray-scale level adjustment means 75 has sub-frame sequence pattern storage means 78.).

Regarding claim 29, Tajima et al. disclose the driving apparatus of claim 28,

wherein the sub-field arrangements are predetermined to reduce contour noise for

different regions having a largest portion of the gray-level distribution (Column 16, lines

21-28 explain that the sequences, i.e. arrangements are predetermined and column 42,

lines 53-60 explain that this is done in order to suppress a false colored phenomenon.).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating
        obviousness or nonobviousness.

5.   Claims 7-8 and 16-17 rejected under 35 U.S.C. 103(a) as being unpatentable

over Tajima et al. (US 6,222,512) in view of Tanabe et al. (US 2003/0011626).

Regarding claim 7, Tajima et al. disclose the driving apparatus as claimed in claim 5.

Tajima et al. fail to teach wherein said adjuster reduces the number of sustaining pulses when gray levels of said data concentrate on a low gray level

Tanabe et al. disclose the driving apparatus as claimed in claim 5 wherein said adjuster reduces the number of sub-fields when gray levels of said data concentrate on a low gray level (Figures 8A-8H and paragraphs [0079]-[0088] show that when the gray scale number is high there is seven or eight subfields, which is an increase in the number of sustaining pulses compared to when there are less sub-fields, since each sub-field contains a sustain pulse as described in Tajima et al.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the sub-field reduction method taught by Tanabe et al. with the driving apparatus as taught by Tajima et al. such that the number of sustain pulses would be reduced/increased in order to produce less power consumption as compared to when the sustain process is performed in each sub-field.

Regarding claim 8, Tajima et al. disclose the driving apparatus as claimed in claim 5.

Tajima et al. fail to teach wherein said adjuster increases the number of sustaining pulses when gray levels of said data concentrate on high gray level

Tanabe et al. disclose a driving apparatus wherein said adjuster increases the number of sustaining pulses when gray levels of said data concentrate on high gray

level (Figures 8A-8H and paragraphs [0079]-[0088] show that when the gray scale

number is high there is seven or eight subfields, which is an increase in the number of

sustaining pulses compared to when there are less sub-fields, since each sub-field

contains a sustain pulse as described in Tajima et al.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the

time the invention was made to use the sub-field reduction method taught by Tanabe et

al. with the driving apparatus as taught by Tajima et al. such that the number of sustain

pulses would be reduced/increased in order to produce less power consumption as

compared to when the sustain process is performed in each sub-field.

Regarding claim 16, this claim is rejected under the same rationale as claim 7.

Regarding claim 17, this claim is rejected under the same rationale as claim 8.

6.   Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Tajima et al. (US 6,222,512) in view of AAPA (Figure 1 and page 1, line 1 to page 4, line

30 of the specification.).

Regarding claim 19, Tajima et al. disclose the driving apparatus of claim 5.

Tajima et al. fails to teach that the apparatus further comprises: an average

picture level controller which detects an average brightness of said data and outputs

information to set a number of sustaining pulses in each of a predetermined number of
sub-fields corresponding to said data.

AAPA discloses a driving apparatus for a plasma display panel comprising of an
average picture level controller (Figure 1, item 17) which detects an average brightness
of said data and outputs information to set a number of sustaining pulses in each of a
predetermined number of sub-fields corresponding to data (Page 3, line 29 to page 4,
line 7 of the specification.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the
time the invention was made that the plasma display panel taught by Tajima et al.
include and APL controller as taught by AAPA in order to allow for the adjustment of the
number of sustaining pulses to provide for a more stabilized brightness of the display.

Regarding claim 20, Tajima et al. and AAPA disclose the driving apparatus of
claim 19.

AAPA also disclose wherein the average picture level detector detects the
average brightness of said data as received from an inverse gamma controller (Figure 1
APL controller 17 receives its input from inverse gamma controller 11B.).

7.   Claim 23-27 and 30 is rejected under 35 U.S.C. 103(a) as being unpatentable
over Tajima et al. (US 6,222,512).

Regarding claim 23, Tajima et al. disclose the driving apparatus of claim 5.

Tajima et al. fail to teach wherein the adjuster generates a histogram of gray-level values corresponding to the gray-level distribution of said data, the adjuster performing said adjustment based on the histogram.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to generate a histogram of gray-level values corresponding to the gray-level distribution of said data with the adjuster performing the adjustment based on the histogram because this would allow for the determination of how the data is distributed and how it should be changed.

Regarding claim 24, Tajima et al. disclose the driving apparatus of claim 5, wherein the detector divides the gray-level distribution into a plurality of predetermined regions (Column 16, lines 34-40 explain that a region is chosen in which the subfield arrangement is chosen.).

Tajima et al. fail to teach wherein the adjuster compares the gray-level distribution in the regions and adjusts the number of sustaining pulses in one or more of the predetermined sub-fields based on the comparison.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to compare the gray-level distribution in the regions and adjust the number of sustaining pulses in

one or more of the predetermined sub-fields based on the comparison because this
would allow for a more uniform brightness of the display over time.

Regarding claim 25, Tajima et al. disclose the driving apparatus of claim 24.

Tajima et al. fail to explicitly teach wherein the adjuster performs said comparison
to determine a region having largest gray-level distribution and adjusts the number of
sustaining pulses in one or more of the sub-fields to produce a corresponding change in
brightness of the displayed image.

However, it would have been obvious to "one of ordinary skill" in the art at the
time the invention was made to modify the adjuster taught by Tajima et al. to perform
the comparison to determine a region having largest gray-level distribution and adjusts
the number of sustaining pulses in one or more of the sub-fields to produce a
corresponding change in brightness of the displayed image in order to provide for a
more uniform display output to the user for a better viewing experience.

Regarding claim 26, Tajima et al. disclose the driving apparatus of claim 25.

Tajima et al. fail to explicitly teach wherein the adjuster decreases the number of
sustaining pulses to less than a predetermined references value when the largest gray-
level distribution is located in a region corresponding to a low range of gray levels.

However, it would have been obvious to "one of ordinary skill" in the art at the
time the invention was made to modify the adjuster taught by Tajima et al. to decrease
the number of sustaining pulses to less than a predetermined references value when

the largest gray-level distribution is located in a region corresponding to a low range of gray levels because lower gray level regions don't use as many sustaining pulses to create a desired brightness level.

Regarding claim 27, Tajima et al. disclose the driving apparatus of claim 25.

Tajima et al. fail to explicitly teach wherein the adjuster increases the number of sustaining pulses to more than the predetermined reference value when the largest gray-level distribution is located in a region corresponding to a high range of gray levels.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to increase the number of sustaining pulses to more than the predetermined reference value when the largest gray-level distribution is located in a region corresponding to a high range of gray levels because higher gray level regions use more sustaining pulses to create a desired brightness level.

Regarding claim 30, Tajima et al. disclose the driving apparatus of claim 29.

Tajima et al. fail to explicitly teach wherein: in a first arrangement, the number of sustaining pulses in the sub-fields changes in ascending order, in a second arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order, the number of sustaining pulses in a second portion of the sub-fields includes a maximum number of sustaining pulses, and the number of sustaining pulses in a third portion of the sub-fields changes in descending order; and in a third

arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order and the number of sustaining pulses in a second portion of the sub-fields are set to a same number of sustaining pulses, however, Tajima et al. do suggest of placing the sub-frames in a descending order (Column 32, lines 38-50).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made that the predetermined sub-field arrangements taught by Tajima et al. would have a first arrangement, the number of sustaining pulses in the sub-fields changes in ascending order; a second arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order, the number of sustaining pulses in a second portion of the sub-fields includes a maximum number of sustaining pulses, and the number of sustaining pulses in a third portion of the sub-fields changes in descending order; and in a third arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order and the number of sustaining pulses in a second portion of the sub-fields are set to a same number of sustaining pulses in order to allow for the reduction of false contour by using an appropriate sub-field arrangement.

(10) Response to Arguments

On page 2 of the Reply Brief the applicant argues that Figure 1 and Figure 3 of Tajima do not perform the "adjuster" function and that the Figures omit the gray level detector recited in claim 5. Specifically, on page 3 of the Reply Brief, the applicant

argues that in order to achieve the invention defined in claim 5 that the gray-scale level adjustment means of Figure 3 must receive as an input a "gray level distribution of data", and then the applicant continues to argue that Tajima does not have this distribution as an input. The examiner would like to point out that this is NOT a limitation in the claim. The claim only states that the adjuster adjusts…IN ACCORDANCE WITH a gray level distribution of said data. The claim does not say that the adjuster must receive this as an input. Furthermore, on page 4 the applicant argues that Tajima does not teach of a gray level detector, and that the means 75 has an intensity data arrangement switching means 101 and frame counter 79, and that neither of these features constitutes a gray level detector. The examiner would like to point out that although Tajima does not teach of something explicitly called a "gray level detector", that as explained in the Examiner Answer mailed 11 September 2007, the means 75 does perform the functions of the "gray level detector" as claimed and thus can be considered a "gray level detector".

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

(12) Conclusion

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Stephen G. Sherman/

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